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(54) **FISHING APPARATUS**

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(51) **Int. Cl.**
A01K 97/12 (2006.01)

(52) **U.S. Cl.** **43/15**; 43/16

(58) **Field of Classification Search** 43/15, 16, 43/21.2

See application file for complete search history.

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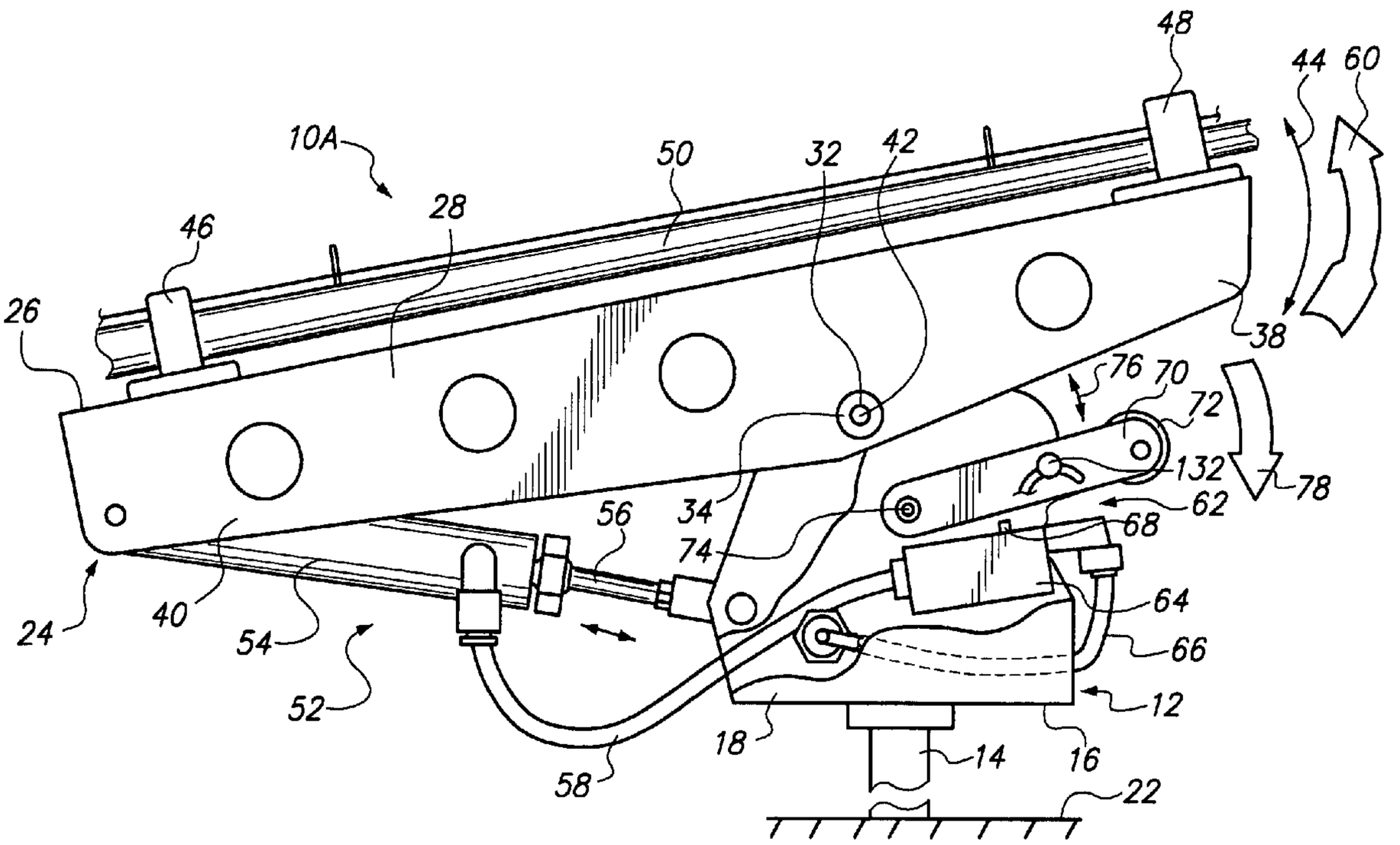
(57) **ABSTRACT**

A fishhook setting apparatus utilizing a lever arm support which holds a fishing rod associated with the fishhook and which is freely rotatable about a pre-determined arcuate path. The trigger mechanism initiates the instantaneous raising of the rod chip through the lever arm support when the lever arm support travels to the extreme portion of an arcuate path.

11 Claims, 4 Drawing Sheets



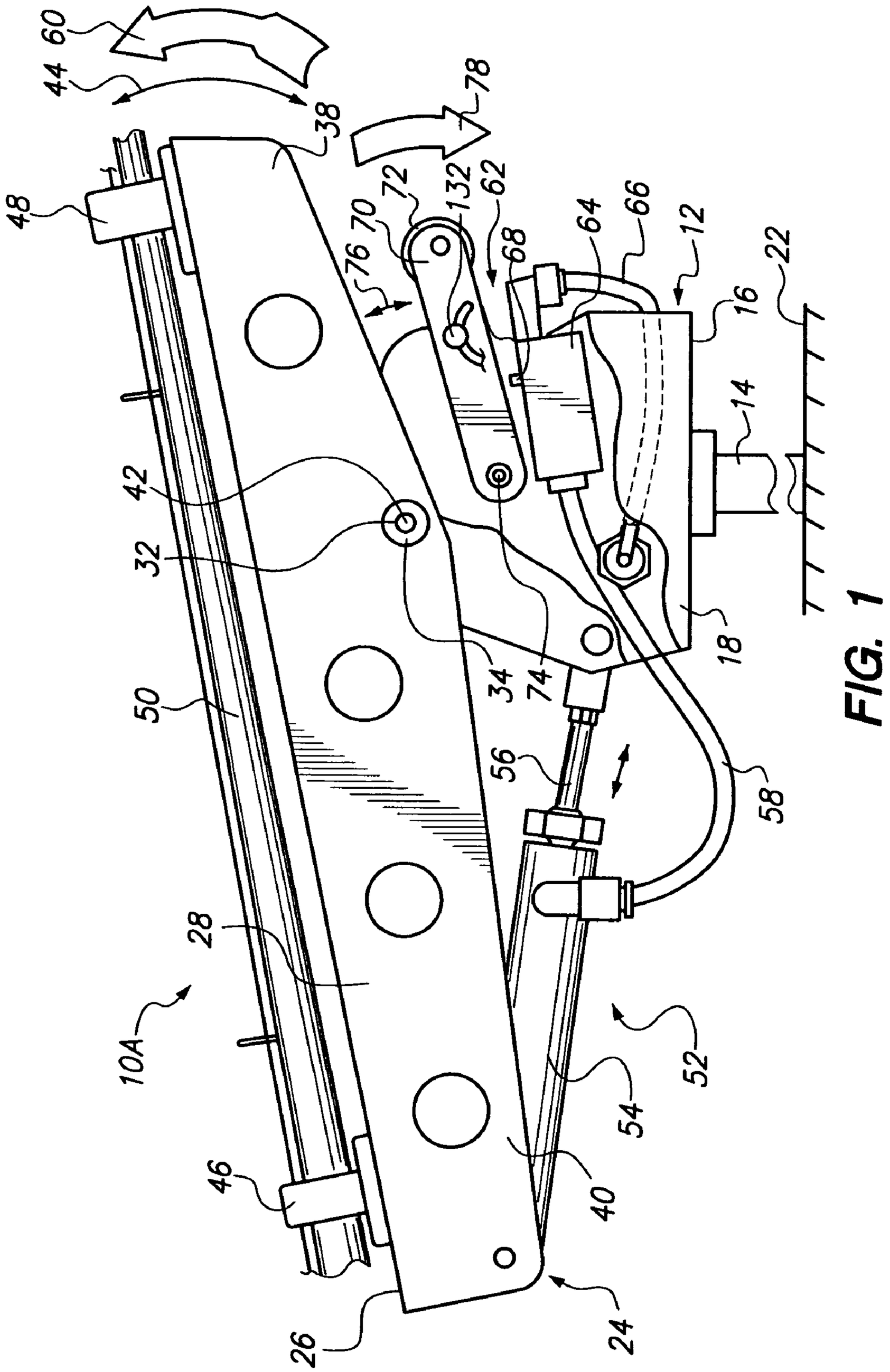

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FIG. 1

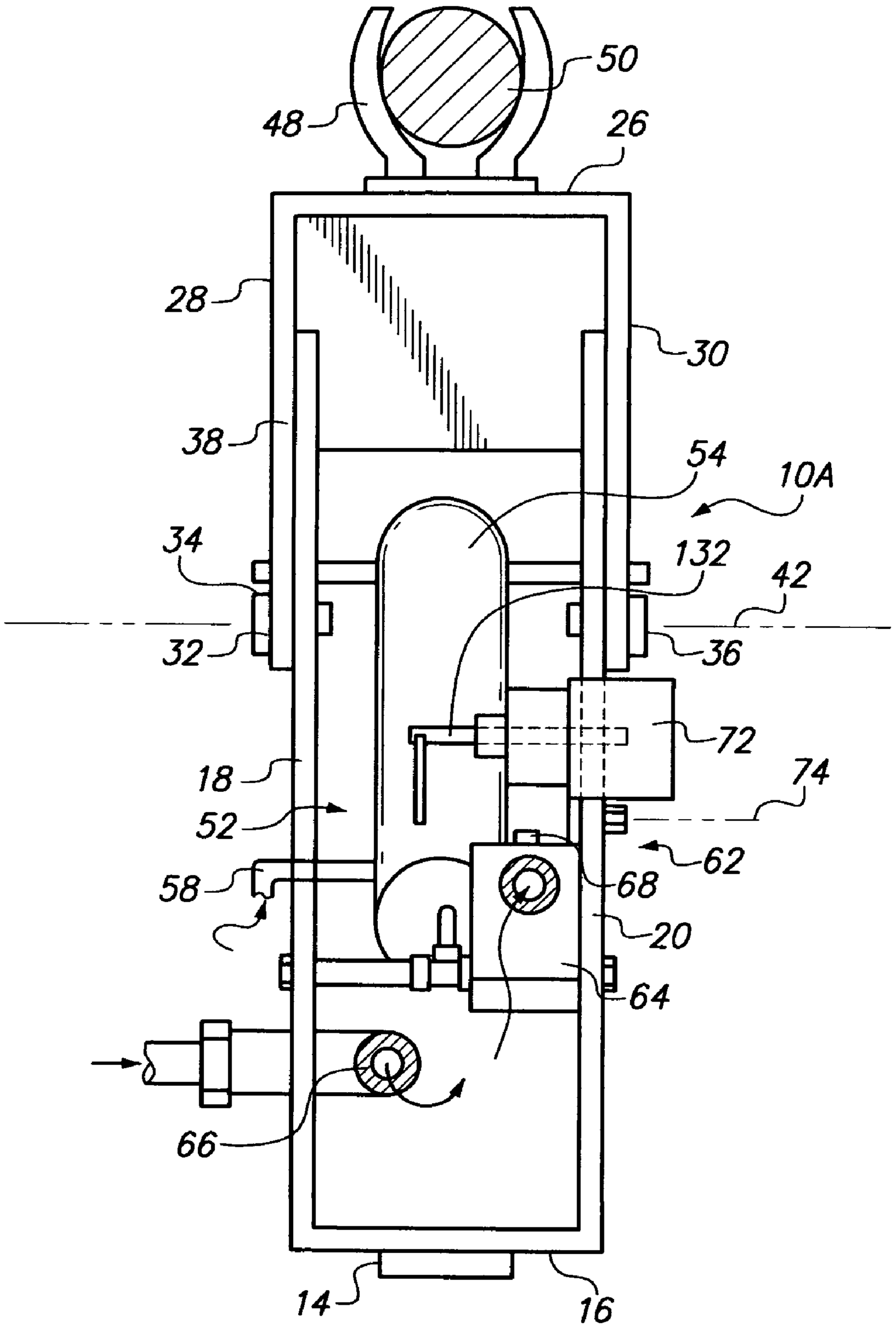
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FIG. 2

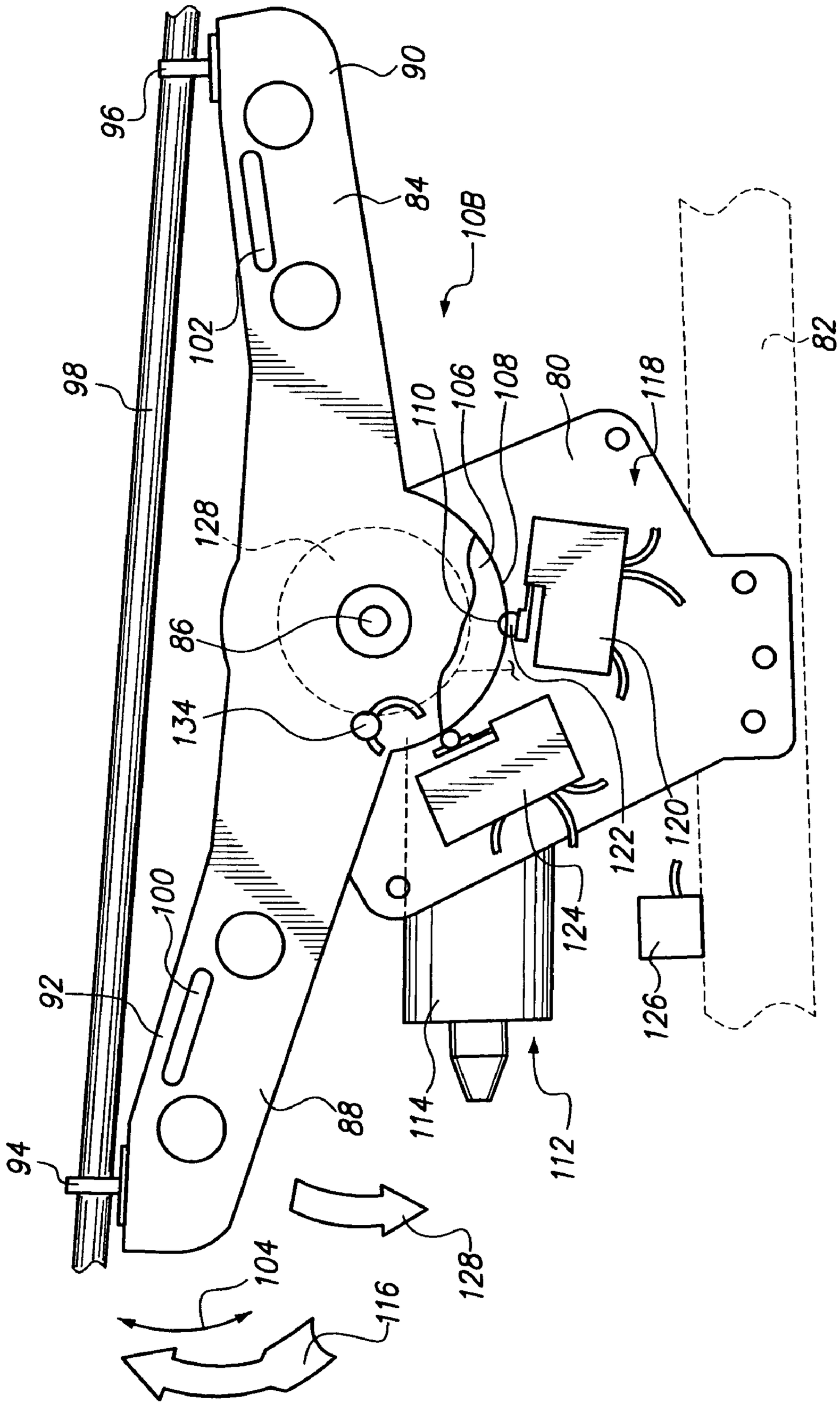
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FIG. 3

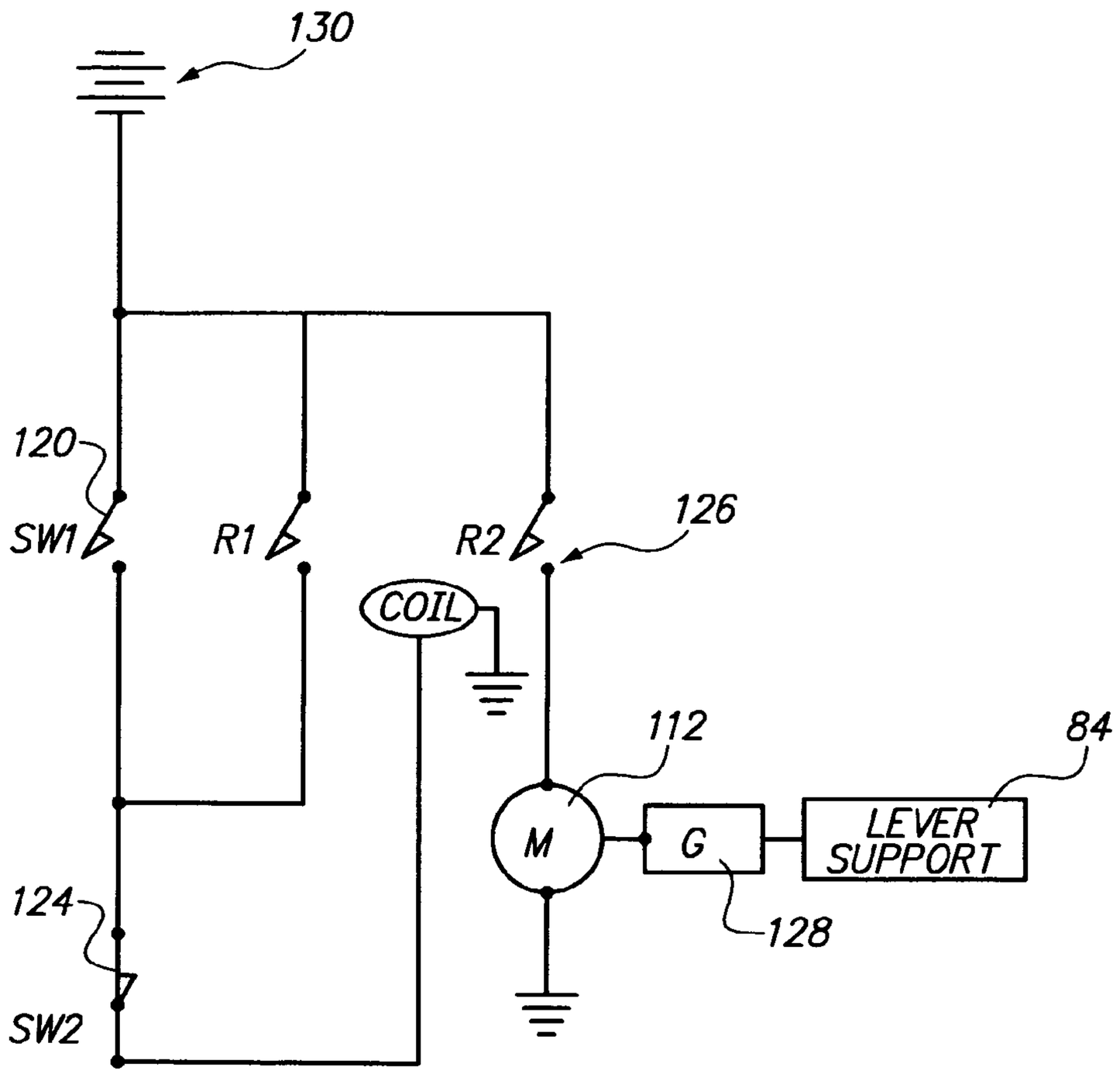

FIG. 4

FISHING APPARATUS

BACKGROUND OF THE INVENTION

The present invention relates to a novel and useful fishing apparatus.

Fishing often requires a great deal of patience and skill. This is especially true when a fisherman presents a lure or bait to fish which are located beneath the surface of the water. In many cases, certain fish will initially take a baited hook, but will reject the same once the hook itself or resistance to the pulling of the baited hook is detected. At this point, an experienced fisherman would quickly set the hook in order to catch the fish. Where a fishing rod and reel, having a baited hook is set in a stand or is not other wise closely attended, the fish is often lost because the initial strike by the fish takes place before the fisherman is able to set the hook.

In the past, many devices have been proposed to automatically trigger the setting of a hook by quickly raising the tip of the rod when a fish initially bites the baited hook. For example, U.S. Pat. Nos. 6,681,516 and 7,086,194 disclose fishing rod holders which latch a fishing rod to a holder and signals a fish strike by the use of a spring mechanism when the fish pulls on a hook connected to the fishing rod through a line.

U.S. Pat. Nos. 4,031,651 4,397,113, and 5,542,205 disclose hook setting devices in which a fishing rod and reel are fixed to a holder that is coupled to a trigger mechanism that lifts the rod tip once a fish strikes the fishing apparatus.

U.S. Pat. No. 5,542,205 shows a fishhook setting device in which the rod and real are placed in a tube and a trigger is engaged when a pawl moves away from a roller via a link arm. Upward movement is afforded by the use of a spring mechanism.

U.S. Pat. Nos. 4,676,018, 5,245,778, and 5,524,376 show spring actuated rod lifters to set fishing hooks in which the fishing line aids in triggering the device when a fish strikes the hook. A spring mechanism is used to rapidly lift the tip of the rod to set the hook.

U.S. Pat. Nos. 4,397,113 and 7,017,296 show hook setting devices for fishing where a spring lifts the rod tip upwardly when the fish strikes the hook connected the line of the fishing pole. The spring action is initiated by a trigger which reacts to the pulling force exerted by the fish striking the hook.

A hook setting device for a fishing apparatus which quickly reacts to the striking action of the fish and accommodates the motion of a boat or the adjacent body of water would be a notable advance in the sporting arts.

BRIEF SUMMARY OF THE INVENTION

In accordance with the present invention a novel and useful hook setting mechanism for a fishing apparatus is herein provided.

The apparatus of the present invention utilizes a base and a fastener which holds the base to a platform. The platform may consist of a fixed surface or be a portion of a water craft.

A lever arm support is employed in the present invention and includes a first arm, a second arm, and a fulcrum. The lever arm support is rotatably attached at its fulcrum to the base. In addition, the lever arm support includes a surface having a mount for confining fishing rod thereto. The lever arm is freely rotatable about the fulcrum within a pre-determined arcuate path to accommodate the motion of the boat or the motion of the body of water in which the fishing apparatus is being used.

A lifter is also employed in the present invention for instantaneously raising and rotating, about the lever arm fulcrum, the first arm of the lever arm support and the tip of the fishing rod. Such trigger may take the form of a pneumatic device or an electrical device. In the latter case, a motor and relay maybe employed with at least one ON switch and one OFF switch. In either case, the lifter maybe easily reset by deactivating the lifter.

A trigger employed with the pneumatic version of the present invention and may include a valve having a actuator which links the valve to a source of compressed air. Compressed air is then fed to a pneumatic cylinder which interacts with the lever arm to allow the lifter to instantaneously rotate the lever arm support. Such trigger may take place by direct contact between the lever arm support and a portion of the valve trigger. Likewise, an intermediate device maybe employed which is capable of contacting the lever arm support and the actuator found at the valve.

In the case of the electrical version of the present invention, such trigger may take the form of a pair of switches, one switch initiating the lifter in its instantaneous rotation of the lever arm support, and another switch stopping the rotation of the lever arm support. Such switches may be activated by a cam surface connected to the fulcrum of the lever arm support.

It may be apparent that a novel and useful fish hook setting apparatus has been hereinabove described.

It is therefore an object of the present invention to provide a fishhook setting apparatus which reliably and quickly sets the hook associated with a fishing rod and reel when a fish exerts pressure on the hook.

Another object of the present invention is to provide a fishhook setting apparatus in which the apparatus maybe mounted on a moving surface or on a fixed surface and accommodates the movement of a body of water or a boat.

Another object of the present invention is to provide a fishhook setting apparatus which employs a source of compressed air or electrical energy to actuate the same.

Yet another object of the present invention is to provide a fishhook setting apparatus which is capable of catching fish that strikes gently on a baited hook or lure connected to a fishing pole.

The invention possesses other objects and advantages as especially as concerns particular characteristics and features thereof which will become apparent as the specification continues.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIG. **1** is a side elevational view of the first, pneumatic, embodiment of the fishhook setting apparatus of the present invention.

FIG. **2** is a right side elevational view of the apparatus depicted in FIG. **1**.

FIG. **3** is a side elevational view of another electrical embodiment of the apparatus of the present invention.

FIG. **4** is an electrical schematic depicting the triggering mechanism of the embodiment depicted in FIG. **3**.

For a better understanding of the invention reference is made to the following detailed description of the preferred embodiments of the invention which should be taken in conjunction with the above described drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

Various aspects of the present invention will evolve from the following detailed description of the preferred embodiments thereof which should be referenced to the prior delineated drawings.

Each embodiment of the present invention is depicted in the drawings by reference character **10** followed by an upper case letter. With reference to FIG. **1**, it may be observed that apparatus **10**A is shown in detail. Apparatus **10**A includes as one of its elements a base **12** having a post **14** which may fit into a suitable support on a dock, a vessel, shoreline, and the like. Base **12** may be formed into a generally U-shaped member having a bottom **16** and two upright plates **18** and **20**. Base **12** and post **14** maybe constructed of any suitable rigid or semi-rigid material. Post **14** serves as a holder for base **18** with respect to platform **22** which, as heretofore described, maybe the deck of a boat, the rail on a pier, the ground surface adjacent a body of water and the like.

Apparatus **10**A is also provided with a lever arm support **24**. Lever arm support **24** may also be formed into a u-shaped member having a top surface **26** and depending side portions **28** and **30**, FIGS. **1** and **2**. Lever arm support **24** is rotatable attached to base **12** at fulcrum **32** via fasteners **34** and **36**. In general, fulcrum **32** separates lever arm support into first arm **38** and second arm **40** which rotate about axis **42**. It should be noted that such rotational movement of lever arm support **24** is free and travels along an arcuate path indicated by directional arrow **44** on FIG. **1**. In addition, surface **26** of lever arm support **24** is fitted with mounts or clips **46** and **48** to confine fishing rod **50**, having a rod tip (not shown) that is oriented toward first arm **38**. Needless to say, fishing rod **50** is also associated with the necessary fishing appurtenances such as a reel, a line, a hook, and the like.

Referring again to FIGS. **1** and **2**, it maybe apparent that apparatus **10**A includes a lifter **52** for instantaneously raising and rotating first arm **38** of lever arm support **24** about fulcrum **32**. Lifter **52**, in embodiment **10**A, includes a pneumatic cylinder **54** having a bar **56** that is linked to base **12**. Prior to activation of lifter **52**, bar **56** serves as a general damping and limiting member for the rocking travel of lever arm support **24** about its arcuate path, directional arrow **44**. Needless to say, lever arm support **24** will follow arcuate path **44** due to the rocking of a boat, the movement of the body of water being fished, and the like. Pneumatic cylinder **54** is employed with a source of compressed air (not shown) which travels to pneumatic cylinder **54** via conduit **58**. Directional arrow **60**, FIG. **1**, represents the instantaneous rotation of first arm **38** due to the rapid action of pneumatic cylinder **54**.

A trigger **62** is also employed in apparatus **10**A of the present invention. Trigger **62** includes a three-way valve **64** which receives compressed air from the source of compressed air via conduit **66**. Trigger **62** is activated by interaction between lever arm support **24**, specifically first arm **38** thereof, with actuator **68**. Such interaction between lever arm support **24** and actuator **68** takes place via a leg **70** having a contact **72** at its end portion. Leg **70** rotates about axis **74** according to directional arrow **76**. Thus, the downward movement of first arm **38**, directional arrow **78**, FIG. **1**, causes the touching by first arm **38** of contact **72**, which in turn allows leg **70** to depress actuator **68** of valve **64**. It should be noted that the downward movement indicated by directional arrow **78** is usually due to a fish taking the bait on a hook, or a lure, associated with fishing rod **50**. Such downward movement **78** goes generally exceeds the normal arcuate path indicated by directional arrow **44**.

Turning now to FIG. **3**, it may be observed that another embodiment **10**B of the present apparatus is depicted. Apparatus **10**B includes a base **80** in the form of a plate which fastens or is held to platform **82**. Again, platform **82** may be similar to platform **22** described with respect to apparatus **10**A. Lever arm support **84** rotates about fulcrum **86** and defines a first arm **88** and a second arm **90** thereof. Upper surface **92** of lever arm support **84**, supports clips **94** and **96**, which in turn, hold fishing rod **98** in place. Slots **100** and **102** maybe employed for straps or other similar items to hold fishing rod **98** in place. Again, lever arm support **84** is capable of traveling along an arcuate path defined by directional arrow **104**. Lever arm support **84** is also includes a disc **106** which circumvents fulcrum **86**. Disc **106** includes an outer surface **108** having a recess **110**.

Lifter **112** takes the form of an electric motor **114** which is connected to a source of power and may employ a gear box **128** to transfer motion from motor **114** to fulcrum **86**. Again, lifter **84** is capable of rotating lever support arm **84** about fulcrum **86** such that first arm **88** instantaneously raises according to directional arrow **116**. Needless to say, the tip (not shown) of rod **98** extends outwardly laterally beyond first arm **88** of lever arm **84**.

Trigger **118** takes the form of a normally open limit switch **120** having a actuator wheel **122** which rides along surface **108** of disc **106**. Entry of wheel **122** into recess **110** of disc **106** activates limit switch **120** causing lifter **112** to rotate first arm **88** about fulcrum **86** of lever support arm **84**. It should be noted that recess **110** will migrate clockwise, in FIG. **3**, until normally closed second limit switch **124** is opened. Limit switch **124** includes an actuator structure similar to limit switch **120**, in this regard.

Limit switch **124** serves to stop the rotation of first arm **88** of lever arm support **84** in its upward motion. Relay **126** interacts with limit switches **120**, and **124** in this regard. Again, the strike of a fish on the hook associated with fishing rod **98** initially lowers first arm **88** sufficiently to allow limit switch **20** to activate lifter **112**. Such downward motion initiated by a fish strike is indicated by directional arrow **128**, FIG. **3**.

FIG. **4** represents an electrical schematic illustrating the operation of apparatus **10**B in which lifter motor **112** is associate with a gear box **128** to rotate lever support **84** about fulcrum **86**. Limit switches **120** and **124** interact with relay **126** to affect the initiation and stopping of the rotational lever support **84** as shown. Source of power **130** maybe a battery, a generator, and the like. In any case, source of power **130** necessarily operates motor **112** through the schematic rendition depicted in FIG. **4** of apparatus **10**B.

In operation, the apparatus **10**A, FIGS. **1** and **2** is mounted on a platform **22** via holder **14** connected to base **12**. Lever arm support **24** is free to follow an arcuate path **44** around fulcrum **32** and, thus, accommodates the rocking of a boat, the wave motion, the body of water, a current, and the like. Upon the striking of a fish on the hook associated with rod **50**, directional arrow **78**, trigger **62** is activated specifically by the touching between first arm **38**, contact **72**, and leg **62** upon actuator **68** of three-way valve **64**. At this point, compressed air from a source passes through conduit **66** and conduit **58** to lifter **52**, in the form of pneumatic cylinder **54**. Pneumatic cylinder **54** then expands instantaneously lifting first arm **38** upwardly, directional arrow **60** to set the hook into a striking fish. Pin **132** will then be pulled to release the same from base **12** to allow resetting of the apparatus shown in FIGS. **1** and **2**. That is to say, valve **64** is inactivated as soon as leg **70** separates from actuator **68**. With respect to the embodiment of **10**B of FIGS. **3** and **4**, lever arm support arm **84** is free to rotate about fulcrum **86** until actuator wheel **122** of limit

switch **120** enters recess **110** of disc **106**. At this point, lifter **112**, in the form of motor **114**, via gear box **128** instantaneously raises first arm **84** of lever support arm, directional arrow **116** to set the hook in a striking fish. Limit switch **124** will deactivate motor **114** when recess **110** interacts with limit switch **124**. Pin **134** will hold lever support arm **84** in the upward position and removal of pin **134** from an opening in base **80** (not shown) will then free up lever support arm **84** to allow it to again follow its free arcuate path, directional arrow **104**, until another fish strikes the hook associated with rod **98**.

While in the foregoing, embodiments of the present invention have been set forth in considerable detail for the purposes of making a complete disclosure of the invention, it may be apparent to those of skill in the art that numerous changes may be made in such detail without departing from the spirit and principles of the invention.

What is claimed is:

1. A fishing apparatus utilized with a platform and a fishing rod having tip

comprising:

a. a base,

b. a holder positioning said base to the platform

c. a lever arm support, said lever support arm including a first arm, a second arm, and a fulcrum, said lever arm support being rotatably attached at said fulcrum to said base, said lever arm support further including a surface and a mount for confining the fishing rod to said surface; said lever arm support being freely rotatable about said fulcrum within a predetermined arcuate path;

d. a lifter for instantaneously raising and rotating, about said fulcrum, said first arm of said lever arm support and the tip of the fishing rod;

e. a trigger initiating said instantaneous raising and rotating about said fulcrum of said first arm of said lever arm support about said fulcrum, said trigger being activated by interaction with said lever arm support and at least a portion of said trigger at an end portion of said predetermined arcuate path, and

f. source of compressed air, and said lifter comprising a pneumatic cylinder spaced between said base and said lever arm support, said trigger comprising a valve having an actuator, said valve linking the source of compressed air to said pneumatic cylinder upon contact of said actuator with said valve, said actuator being positioned to interact with said lever arm support upon rotation thereof along said predetermined arcuate path.

2. The apparatus of claim **1** in which said mount comprises a clip.

3. The apparatus of claim **1** in which additionally comprises a leg rotatably attached to said base, said leg lying intermediate said lever arm support and said portion of said trigger.

4. The apparatus of claim **1** which additionally comprises a stop for halting the instantaneous raising and rotating, about said fulcrum, of said first arm of said lever arm support.

5. A fishing apparatus utilized with a platform and a fishing rod having tip

comprising:

a. a base,

b. a holder positioning said base to the platform

c. a lever arm support, said lever support arm including a first arm, a second arm, and a fulcrum, said lever arm support being rotatably attached at said fulcrum to said base, said lever arm support further including a surface and a mount for confining the fishing rod to said surface; said lever arm support being freely rotatable about said fulcrum within a predetermined arcuate path;

d. a lifter for instantaneously raising and rotating, about said fulcrum, said first arm of said lever arm support and the tip of the fishing rod;

e. a trigger initiating said instantaneous raising and rotating about said fulcrum of said first arm of said lever arm support about said fulcrum, said trigger being activated by interaction with said lever arm support and at least a portion of said trigger at an end portion of said predetermined arcuate path, and

f. a source of electrical energy and in which said lifter comprises an electric motor linked to said lever arm support, said trigger comprising one electrical switch having an actuator, said actuator of said one electrical switch being positioned to interact with said lever arm support upon rotation thereof along said predetermined arcuate path, and actuating said one electrical switch to divert said source of electrical energy to said electric motor, thereby.

6. The apparatus of claim **5** which further comprises at lest one electric relay located intermediate said one electrical switch and said electric motor.

7. The apparatus of claim **5** which additionally comprises a stop for halting the instantaneous raising and rotating, about said fulcrum, of said first arm of said lever arm support.

8. The apparatus of claim **7** in which said stop comprises another electrical switch, said another electrical switch having an actuator, said actuator of said another electrical switch being positioned to interact with said lever arm support upon rotation thereof along said predetermined arcuate path.

9. The apparatus of claim **5** which additionally comprises a gear, said gear activated by said electric motor and interacting with said lever arm support to rotate said lever arm support along a predetermined arcuate path.

10. The apparatus of claim **5** in which said mount comprises a clip.

11. The apparatus of claim **5** in which additionally comprises a leg rotatably attached to said base, said leg lying intermediate said lever arm support and said portion of said trigger.

* * * * *